

# **Railroad Commission of Texas**

Alternative Fuels Research &  
Education Division (AFRED)

# **LPG Workshop**

*U.S. Department of Energy  
Clean Cities International Program  
Secretaría de Energía (SENER)*

*Mexico City  
November 7, 2003*

# **State-Level Incentives for LPG Use**

# Contents

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## **Texas LPG “Checkoff” (AFRED, 1991)**

- History
- Programs
- Results, 1991-2003

## **Texas Emissions Reduction Plan (2001)**

- History
- Programs
- Opportunities, 2003-2008



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Texas LPG Checkoff Program

## **LPG in Texas**

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- Texas ranks first among U.S. states in the production and consumption of LPG.
- ~ 90 percent is used as manufacturing feed stock.
- ~ 10 percent is odorized and marketed as fuel.
- Competitors: each other; electricity, diesel, gasoline
- ~ 1,050 retail outlets

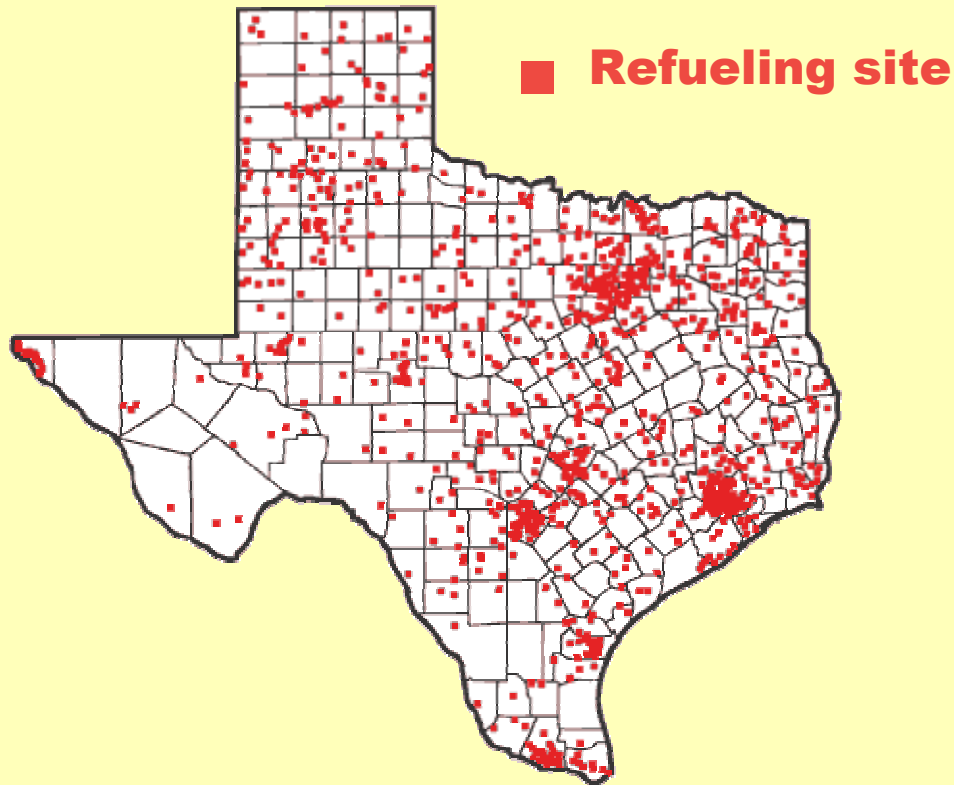


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Texas LPG Checkoff Program

# LPG in Texas

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**More than 1,000  
public refueling  
sites in Texas**



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# LPG in Texas, 1991

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- Competing ineffectively; long-term decline in every market; lost 60MM gal./yr. to electricity
- Old technology
- No marketing tools or coordinated marketing strategy
- Little technical training or worker safety training
- Poor public image
- No state or federal grants or other assistance
- RESPONSE: self-help “checkoff,” effective August 1991



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# AFRED Programs

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- Research, development & demonstration
- Employee safety training
- Marketing
- Public education



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# Research & Development

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- NEED: cleaner, more efficient, year-round technology
- Low-emission engines
- Clean agricultural uses
- On-site electricity generation
- AFRED'S ROLE: develop and demonstrate new technology for Texas, through public/private partnerships



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# Current AFRED R&D projects

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**2007-certified  
LPG industrial  
forklift truck engine**  
(US\$1.4M, PERC, Southwest  
Research Institute)



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# Current AFRED R&D projects

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**Residential 5 kW**

**LPG fuel cell**

(US\$1.43M, PERC, Plug  
Power, HyRadix)



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# Current AFRED R&D projects

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**LPG fuel processor**  
(US\$1.43M, PERC, Plug Power, HyRadix)



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# Current AFRED R&D projects

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**74-hp LPG tractor**  
(US\$350K, John Deere,  
PERC, Southwest Research)



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# Current AFRED R&D projects

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**LPG weed/pest/  
pathogen control**  
(US\$978K, cotton,  
vegetables, broiler  
chickens)



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# Current AFRED R&D projects

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**LPG switcher  
locomotive—US\$3.9M  
(pending)**



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# Safety Training

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- NEED: safe, competent work force
- 10,000 LPG workers in Texas, all certified by RRC
- Certified workers must take one eight-hour class in their area of certification the first year and every four years thereafter.
- AFRED trained 2,863 students in fiscal year 2003.
- 79 percent of classes held outside Austin
- Automotive training includes fleet and forklift technicians, aftermarket converters, school districts.



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# Safety Training

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## Course catalog

Keyed to categories of LPG certification

- LP-Gas Basics
- ASME Tanks/DOT Cylinders
- Bobtail Operations
- Residential System Design
- Cylinder Filling
- Residential System Installation
- Appliance Controls
- Residential System Inspection
- Appliance Troubleshooting
- Regulatory Compliance



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# Marketing & Public Education

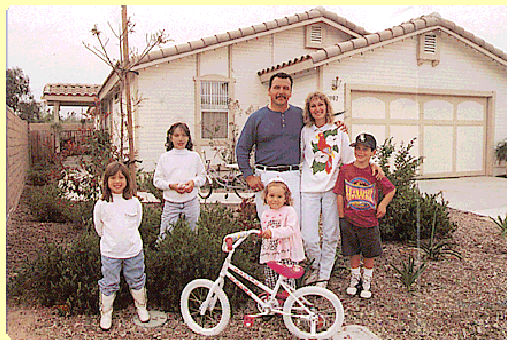
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- NEED: coordinated marketing strategy; marketing tools; visibility, consistent positive image
- Market research (e.g., LPG tractor, 5 kW fuel cell)
- Consumer rebates (US\$1.2M a year)
- Incentives for manufactured housing, highway signs, propane school buses, closed-loop forklifts, commercial mowers



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# Marketing & Public Education



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# Marketing & Public Education

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- LPG access to federal low-income energy assistance
- Trade shows and exhibits
- Advertising/media rebates/marketer web sites
- Marketer co-op advertising
- *Propane Services Directory* and web site
- Secondary school science curriculum supplement



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## Marketing & Public Education

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# Help is on the way!



LPG access to  
federal low-income  
energy assistance



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# Marketing & Public Education



Trade shows  
and exhibits



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# Marketing & Public Education

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Marketer co-op  
advertising



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# Marketing & Public Education



Advertising/media  
rebates/marketer  
web sites



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# Marketing & Public Education



**PROPANE OUTLET DIRECTORY**

SEARCHABLE DATABASE

If you are in Texas and need propane (LP gas), this web site will help you find it. The site lists more than 1,000 places where travelers and Texas residents alike can find fuel and service for propane-powered appliances, vehicles and equipment.

Type your search words below. Search by company name, city or county. Separate multiple words by a space only. You may also check the services you are seeking.

**Search by Company**  
Search by City  
Search by County

**Services:** (check all that apply)  
☐ Engine conversions and fuel system repairs  
☐ Cylinder repair and refilling  
☐ Motor fuel service  
☐ Residential service

SEARCH

**Search for Propane Star Builders.** Search by company name, city or county. Separate multiple words by a space only.

**Search by Company**  
Search by City  
Search by County

SEARCH

**Search for LP-Licensed Plumbers.** Search by company name, city or county. Separate multiple words by a space only.

**Search by Company**  
Search by City  
Search by County

SEARCH

*Propane  
Services  
Directory and  
web site*



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# Marketing & Public Education

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**ALTERNATIVE  
ENERGY**

Middle-school science  
curriculum supplement



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# Marketing & Public Education

## RRC reminds consumers about new safety requirements for propane barbecue bottles

### Ward Campbell of Haigood & Campbell

they may find they need a new safety device when they take their older propane cylinders to be refilled. An overfilling prevention device (OPD) is required by the Railroad Commission's new LP-Gas Safety Rules. The OPD offers additional

a conventional relief tank. As a cylinder is refilled and the propane liquid level rises, the floating device also rises. When the propane liquid fills approximately 90 percent of the cylinder's volume, the OPD valve mechanism shuts off the liquid flow into the cylinder. Filling to 90 percent allows room for expansion due to warmer weather.

"You can tell if your bottle has an

## Dorris reminds of propane safety device

Ben Dorris of Roadrunner Energy

cylander with too much propane.

"Because propane expands as it gets warmer, it is important not to exceed the proper filling limit for each cylinder, to avoid an unintentional release of gas," continued Dorris. "The OPD provides a safety

device that can tell if your bottle has an OPD as one of two ways," explained Dorris. "The tank may have a special triangular handle" with the OPD on it, or the tank may have an OPD wrapper. Propane cylinders manufactured after October 1998 already contain OPDs.

For more safety tips on propane grilling, call the Texas Railroad Commission at (512) 305-6131, ext. 1-300-642-55.

## Rath offers propane safety tips

Erwin Rath of Cuero-Yoakum Gas Co. in Cuero

that it is safe for continued use," said Rath. "Because propane expands as it gets warmer, it is important not to exceed the proper filling limit for each cylinder, to avoid an unintentional release of gas," continued Rath. "The OPD provides additional protection and helps keep cylinders from being overfilled."

The OPD is mounted to the front of a conventional relief tank. As a cylinder is refilled and the propane liquid level rises, the floating device also

As approximately 90 percent of the cylinder's volume, the OPD valve mechanism shuts off the liquid flow into the cylinder. Filling to 90 percent allows room for expansion due to warmer weather.

"You can tell if your bottle has an OPD in one of two ways," explained Rath. "The tank may have a special triangular handle" with the letters "OPD" on it, or the tank may have an OPD wrapper. Propane cylinders manufactured after October 1998 already contain OPDs.

For more safety tips on propane grilling, call the Texas Railroad Commission at (512) 305-6131, ext. 1-300-642-55.

## RRC recognizes Canavan & Co. as Propane Super Star

The Texas Railroad Commission has named Wm. Canavan & Co. of Boerne as a 2002 Propane Super Star award. Wm. Canavan Custom Homes showcases the natural

Propane Super Stars are chosen each year by a panel of propane consumers coordinated by the Railroad Commission's Alternative Fuels Research and Education Division.

Canavan was one of 35 organizations and individuals to receive the 2002 honor. "We personally work with each homeowner through every step of the building process," said Canavan. "We always

## New propane safety rules

Wayne Nelson of Nelson

Propane is a flammable gas. When propane is released, it can ignite and cause a fire or explosion. To prevent this, the Railroad Commission has adopted new safety rules for propane cylinders. The rules require that all propane cylinders have an OPD valve to ensure that at it is safe for continued service."

"Because propane expands as it gets warmer, it is important not to exceed the proper filling limit for each cylinder, to avoid an unintentional release of gas," continued Nelson. "The OPD provides a safety

# News releases

## New overfill valve needed

OPD is must to fill propane tanks beginning April 1



One of the new OPD valves for propane tanks.

## New safety measures required for propane bottles

Bay City - Frank Hurley of Pro Am

"Because propane expands as it gets warmer, it is important not to exceed the proper filling limit for each cylinder, to avoid an unintentional release of gas," continued Hurley. "The OPD provides a safety

As a cylinder is refilled and the propane liquid level rises, the floating device also rises. When the propane liquid fills approximately 90 percent of the cylinder's volume, the OPD valve mechanism shuts off the liquid flow into the cylinder. Filling to 90 percent allows room for expansion due to warmer weather.

"You can tell if your bottle has an OPD in one of two ways," explained Hurley. "The tank may have a special triangular handle" with the letters "OPD" on it, or the tank may have an OPD wrapper. Propane cylinders manufactured after October 1998 already contain OPDs.

For more safety tips on propane grilling, call the Texas Railroad Commission at (512) 305-6131, ext. 1-300-642-55.

Propane tanks are not to be refilled with propane if they do not have an OPD valve. The Railroad Commission has adopted new safety rules for propane cylinders. The rules require that all propane cylinders have an OPD valve to ensure that at it is safe for continued service."

## Need new propane valve?

### J&B Propane

When they take their older propane cylinders to be refilled, an overfilling prevention device (OPD) is required by the Railroad Commission's new LP-Gas Safety Rules. The OPD offers additional

a conventional relief tank. As a cylinder is refilled and the propane liquid level rises, the floating device also rises. When the propane liquid fills approximately 90 percent of the cylinder's volume, the OPD valve mechanism shuts off the liquid flow into the cylinder. Filling to 90 percent allows room for expansion due to warmer weather.

"You can tell if your bottle has an OPD as one of two ways," explained J&B Propane. "The tank may have a special triangular handle" with the letters "OPD" on it, or the tank may have an OPD wrapper. Propane cylinders manufactured after October 1998 already contain OPDs.

For more safety tips on propane grilling, call the Texas Railroad Commission at (512) 305-6131, ext. 1-300-642-55.

### Bob Park, manager of Aves Oil, Inc.

"Because propane expands as it gets warmer, it is important not to exceed the proper filling limit for each cylinder, to avoid an unintentional release of gas," continued Park. "The OPD provides a safety

device that can tell if your bottle has an OPD as one of two ways," explained Park. "The tank may have a special triangular handle" with the letters "OPD" on it, or the tank may have an OPD wrapper. Propane cylinders manufactured after October 1998 already contain OPDs.

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## Old bottles may need updating for summer

### Ed Sipes of Wise Services Company Fuel

Propane is a flammable gas. When propane is released, it can ignite and cause a fire or explosion. To prevent this, the Railroad Commission has adopted new safety rules for propane cylinders. The rules require that all propane cylinders have an OPD valve to ensure that at it is safe for continued service."

"Because propane expands as it gets warmer, it is important not to exceed the proper filling limit for each cylinder, to avoid an unintentional release of gas," continued Sipes. "The OPD provides a safety

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## STATE-LEVEL INCENTIVES FOR LPG USE

# Marketing & Public Education

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## Current/pending market research

- LPG switcher locomotive (2003)
- John Deere propane tractor (in progress)
- 5 kW residential fuel cell (in progress)
- Heavy-duty propane agricultural engine (pending)



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# Marketing & Public Education

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## Consumer rebates, fiscal 2004

### Water heater

new construction	\$150
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replace electric	\$300
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All-LPG home	\$750
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<b>Budget:</b>	<b>\$1,163,157</b>
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# AFRED Funding

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## Texas LPG Delivery Fee

- ~ US\$0.005/gallon on odorized LPG; exports exempt.
- Assessed at the time odorant is added or odorized LPG is imported.
- Marketer pays supplier; supplier remits monthly to RRC
- Average revenue \$2.15M/year
- 50 percent is dedicated by statute to consumer rebate programs.



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# AFRED Funding

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## Leveraged funds history

- Since 1992, AFRED has leveraged \$41.3 million for LPG in Texas . . .
- \$10.9 million through the Railroad Commission, and
- \$30.4 million through other entities (e.g., marketers, fleet operators, agencies, research organizations).

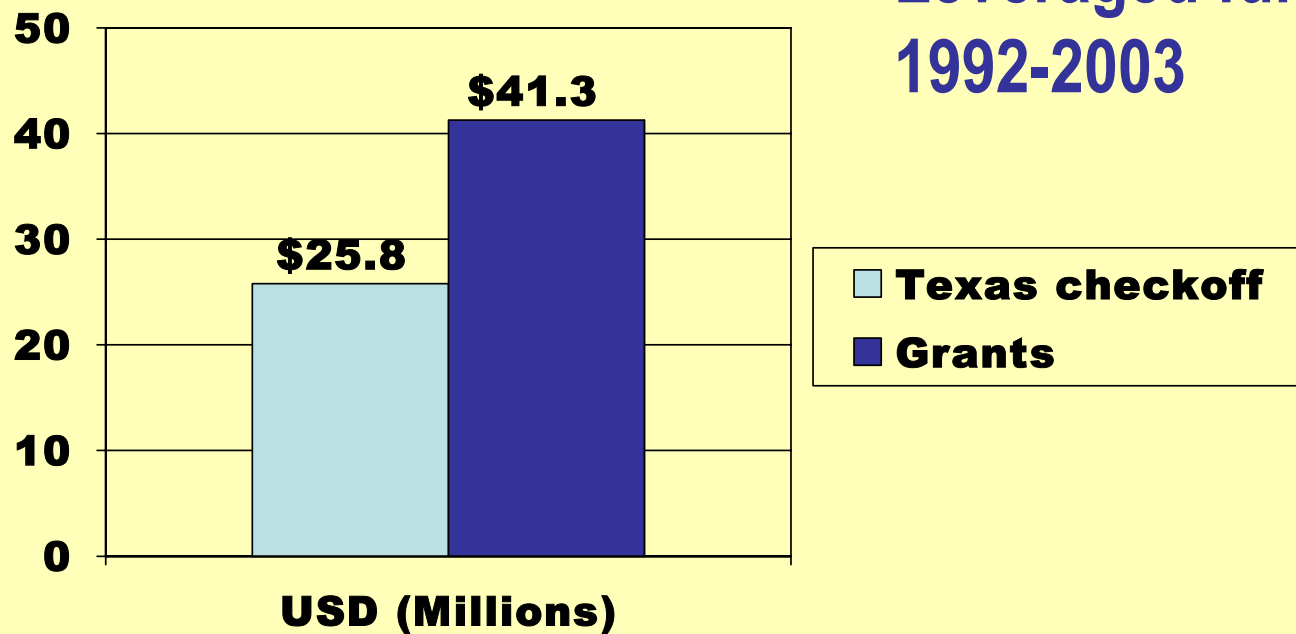


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# AFRED Funding

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Leveraged funds  
1992-2003



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# AFRED Results

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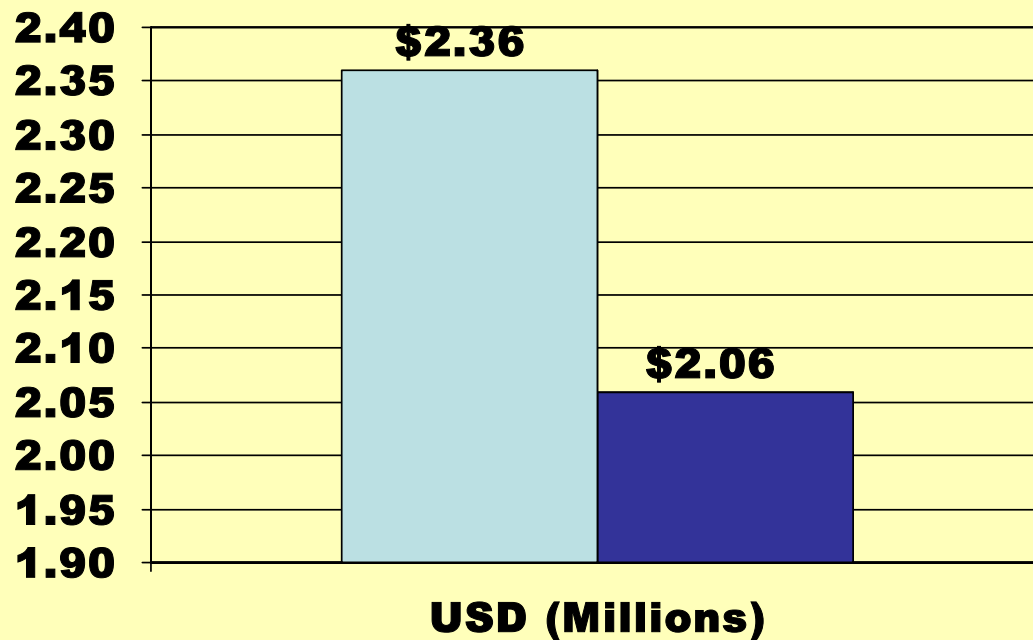
- Based on delivery-fee revenue, Texas' retail gallons have increased an average of 1.6% per year since 1992.
- 70 percent of full-service marketers use AFRED programs and materials.
- Model for 10 other state LPG checkoffs since 1991
- Model for U.S. national checkoff (Propane Education and Research Council, 1998)



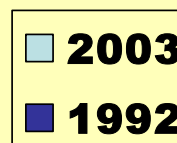
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# AFRED Funding

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15% increase in  
delivery-fee  
revenues since 1992



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# Texas Emissions Reduction Plan (TERP)

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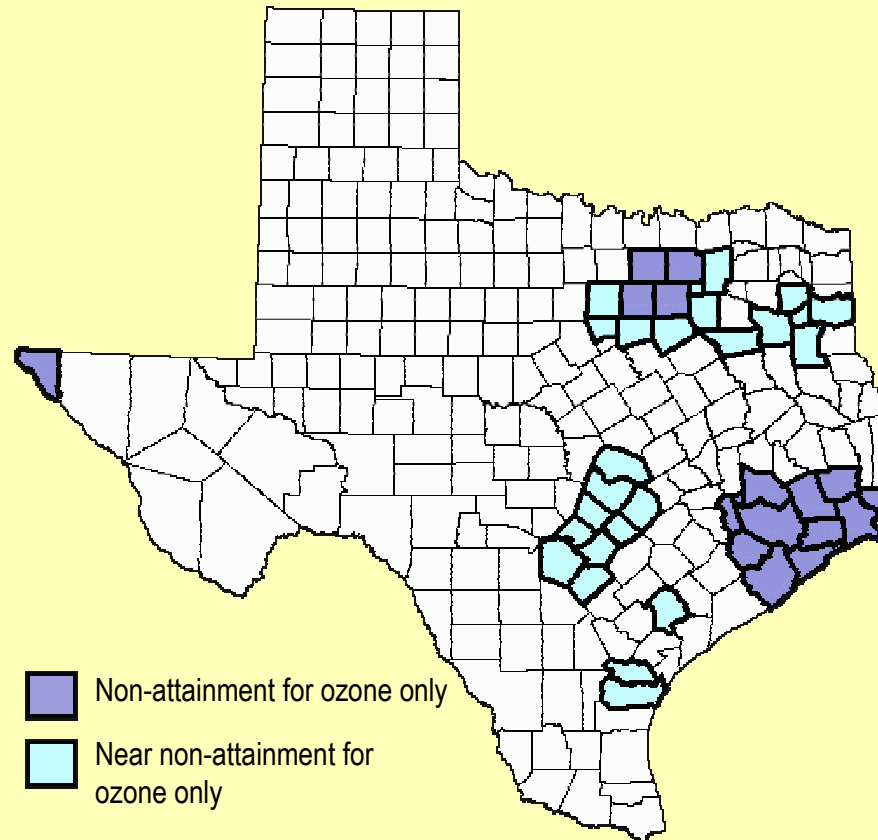
- Texas must reduce NO<sub>x</sub> in Houston and Dallas areas by 35 tons per day (TPD) by 2007 to meet federal standards.
- The Texas Legislature created TERP in 2001 to achieve these reductions, plus an additional 20 TPD of the 56 total TPD required in Houston.
- Other TERP-eligible areas are Beaumont-Port Arthur, El Paso, Austin, San Antonio, Tyler and Corpus Christi.
- TERP is administered by the Texas Commission on Environmental Quality.



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# Affected counties

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# **TERP Funding: \$150M/year**

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- Average revenue US\$150 million/year, 2004-2008
- 87.5 percent (\$131M) for emission-reduction grants
- 9.5 percent (\$14.2M) for new technology: research, development and demonstration
- 3.0 percent (\$4.5M) administration
- No funding for light-duty vehicle purchases or leases.
- No funding for energy-efficiency programs.



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# Incremental costs

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- TERP grant pays the incremental cost of cleaner equipment.
- Example:
  - To replace an existing diesel engine with a cleaner engine costs \$20,000.
  - TERP will pay \$20,000 towards the purchase of the cleaner engine, which could be LPG.



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# New purchase or lease

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- On-road vehicles > 8,500 lb (>3,864 Kg) and non-road equipment >25 hp (>18.6 KW) are eligible.
- Must be certified 25 percent lower NOx than current federal standard.
- Grant covers incremental cost above baseline.
- Any fuel type; LPG is eligible.
- Vehicle must operate 75 percent in affected counties.
- Must cost <US\$13,000/ton (<\$11,791/metric ton) of NOx reduced.



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# **Engine repower / replacement**

- “Repower” means replacing the engine of an existing vehicle or piece of equipment.
- The replacement engine must be certified at 25 percent lower NOx than the engine being replaced.
- The old engine must be scrapped.
- Project must reduce NOx for less than \$13,000/ton.



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# Retrofits or add-ons

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- “Retrofit” means at the time of rebuilding an existing engine, installing a “kit” that reduces NOx at least 25 percent below the original certification level.
- “Add-on” means installing a “kit” that reduces NOx at least 25 percent below the original certification level in the absence of a complete rebuilding of the engine.
- Must meet the <\$13,000/ton requirement.



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# **Replacements (proposed)**

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- Replace old vehicle or equipment with new or newer vehicles or equipment.
- New vehicle or equipment must be certified 25 percent lower NOx than the old vehicle or equipment.
- Old vehicle or equipment must be scrapped or removed from Texas and not returned.
- Incentive amount based on cost-effectiveness, not to exceed the cost of the replacement vehicle or equipment, minus scrap value.



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# **Stationary engines (proposed)**

- Engines <25 hp (<18.6 KW)
- May include: lease/purchase; replacement; repower; retrofit/add-on; infrastructure
- Qualifying fuels eligible, e.g., LPG
- Limited to stationary engines that are not required to meet emissions standards under existing rules or permit conditions (e.g., most agricultural equipment).



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# Refueling infrastructure

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- TERP will pay for the costs of on-site refueling stations for qualifying fuel (e.g., LPG).
- Will pay for the costs of on-vehicle infrastructure projects to reduce engine emissions while idling.
- Infrastructure projects are exempt from \$13,000 per ton cost-effectiveness requirement.



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# Incremental fuel costs

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- TERP will pay for any incremental cost difference between a conventional fuel and a “qualifying fuel,” e.g., LPG.
- Contracts limited to 30 months and may be renewed.
- Must meet the \$13,000/ton threshold.



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# Demonstration projects

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- Projects that demonstrate practical, low-emission re-power, retrofit and other advanced technologies for on-road heavy-duty vehicles and off-road equipment.
- May include use of LPG for new engines and vehicles that may produce very low NOx emissions.
- Will pay for most costs associated with the project, subject to case-by-case determination.



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# Third-party grants

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- TCEQ may consider allowing third parties to apply for grants on behalf of vehicle or equipment operators.
- Pass-through programs: third party solicits, awards, contracts for, and monitors grant award.
- Must comply with TCEQ grant requirements.
- Still to be determined when and how the TCEQ would solicit and award a third-party grant.



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# Small-business grants

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- “Small business” means an entity that owns only two vehicles or pieces of equipment, one of which is either a pre-1994 vehicle or non-road equipment with an uncontrolled engine.
- Initially, limited to repower and replacement grants for the eligible vehicles or equipment.



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# School buses

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- New school buses (LPG, natural gas or cleaner diesel technology)
- Replace or repower older school buses
- Retrofits and add-on systems for school buses (e.g., EGR, Selective Catalytic Reduction (SCR), new catalyst systems)
- Use of qualifying fuel (e.g., LPG, ultra-low sulfur diesel)



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# Next steps for TERP

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- Adoption of new guidelines: October 24, 2003
- Consolidation of research, development and demonstrations in TCEQ: November 1, 2003
- New program funding: November/December
- Requests for proposals: December/January 2004
- Full implementation: 2004



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# Contacts

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## **AFRED—Dan Kelly**

[www.rrc.state.tx.us](http://www.rrc.state.tx.us)

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## **TERP—Steve Dayton**

[www.tnrcc.state.tx.us/oprd/sips/terp.html](http://www.tnrcc.state.tx.us/oprd/sips/terp.html)

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